Topics in Subtropics Newsletter

University of California Cooperative Extension

Fresno, Kern, Madera, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara, Tulare, &Ventura Counties

News from the Subtropical Tree Crop Farm Advisors in California

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Editor's Note:

Please let us know if your mailing address has changed, or you would like to add someone else to the mailing list. Call or e-mail the farm advisor in the county where you live. Phone numbers and e-mail addresses can be found in the right column.

Please also let us know if there are specific topics that you would like addressed in subtropical crop production. Copies of Topics in Subtropics may also be downloaded from the county Cooperative Extension websites of the Farm Advisors listed.

Neil O'Connell
Editor of this issue

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NRCS Announces Initiative to Improve Agricultural Energy Efficiency

Individual Energy Audits Will Help Producers Reduce Energy Use

DAVIS, Calif., May 17, 2010 – USDA's Natural Resources Conservation Service (NRCS) today announced an initiative designed to help California agricultural producers transition to more energy efficient operations. This initiative will make funding available for individual on-farm energy audits designed to save both money and energy when fully implemented.

"Helping California's farmers and ranchers reduce energy use helps everyone's bottom line," said Ed Burton, NRCS State Conservationist for California. "More efficient energy use will help our agricultural producers, and Californians, become more energy independent."

California is one of 29 states receiving funding for on-farm energy audits in fiscal year 2010 through the 2008 Farm Bill's Environmental Quality Incentives Program (EQIP). As much as $225,000 is available in California to assist up to 150 farmers and ranchers with audits.

The energy audits will be individually tailored to assess each farm's primary energy uses such as milk cooling, irrigation pumping, heating and cooling of livestock production facilities, manure collection and transfer, grain drying and other similar on-farm activities.

NRCS California will pay for the initial audits and the associated Agricultural Energy Management Plan (AgEMP). The AgEMP provides producers a roadmap for future implementation of energy-efficient practices.

Applications are due at local NRCS offices on or before June 18, 2010. Funding is available on a first-come, first-serve basis. If approved for funding, producers will be asked to select an NRCS-certified local Technical Service Provider, or contractor, to perform the audit and develop the AgEMP.

"Once an energy plan is developed for a specific farm or ranch, the producer may have the opportunity to apply for cost share through EQIP to implement some of the plan's recommendations," Burton said. "NRCS is providing California's agricultural producers a number of resources to really become energy efficient."

For more information, producers can contact their local USDA Service Center or visit www.nrcs.ca.usda.gov/programs.

NRCS is celebrating its 75th year of "helping people help the land." Since its inception in 1935, NRCS has worked in partnership with private landowners and a variety of local, state and federal conservation partners to deliver conservation based on specific, local needs.

Periwinkle Provides Ammunition in the War on Citrus Plague

A team of scientists from the Agricultural Research Service (ARS) and the University of Florida's Indian River Research and Education Center.

(IRREC) have turned an ornamental plant into a tool for combating a bacterial disease that threatens the world's citrus crop. Periwinkle (Catharanthus roseus) has proved to be an effective screening tool for treatments to control Huanglongbing (HLB), according to Yong-Ping Duan of the ARS U.S. Horticultural Research Laboratory (USHRL) in Fort Pierce, Fla.

Duan and his colleagues have found that periwinkle performs well as a stand-in for citrus, becoming quickly infected with HLB bacterium and responding well to antibiotic compounds tested to reduce infection.

Duan's colleagues included William W. Turechek and Ed Stover, both at USHRL, and Mu-Qing Zhang, Lijuan Zhou and Charles A. Powell of IRREC.

The researchers used HLB-infected lemon trees to infect periwinkle plants and then ran greenhouse experiments to find the optimal nutrient and soil treatments for regenerating periwinkle with high infection rates. They also soaked infected periwinkle cuttings in different chemical compounds and found that two of them performed well as potential HLB treatments.

The team published the results in the journal Phytopathology. Duan emphasized that the results are limited to greenhouse settings and that the chemical compounds, penicillin G sodium and biocide 2,2- dibromo-3-nitrilopropionamide (DBNPA), must still be evaluated in field trials and approved for use by regulatory agencies before commercial use is possible.

Do we really need *Scientific* Irrigation Scheduling?

Blake Sanden
Irrigation & Agronomy Advisor

At first thought this sounds like a dumb question. Of course we need to schedule irrigations … just like we schedule lunch; we get hungry, plants get thirsty. End of story. But how many of you skip lunch, or delay it? How often? If you're like some of us old agronomists that can't jump across the head ditch as easily as we used to and you look down and can't see as much of your feet as you did when you were 25 then you think, "Probably better if I skipped lunch anyway." Then you think on this idea even more and you say, "Well, I just ain't gonna eat anything until I see this gut disappear." But we all know this is bad idea as we still need balanced nutrition regularly even if we do have some extra weight.

So before you think I'm completely out to lunch – here's the connection: if you don't irrigate until you see the crop stress you've waited too long. If you just keep irrigating every three days with microsprinklers (Hey, that's a schedule, right!?) from May to August without checking the soil/plant water status it's like eating that foot long sub sandwich every day for lunch and never stepping on the scale! Neither extreme is healthy for you or the crop.

In many ways the San Joaquin Valley has already been placed on a forced diet. A combination of hydrologic and "judicial" drought (The latter being restrictions of State and Federal Project pumping out of the Delta due to Endangered Species Act listing of the Delta Smelt) has drastically cut the import of fresh water to the SJV over the last 3 to 5 years. Growers and water districts have responded by pumping more groundwater, buying "emergency pool" water and other market trades, improving field irrigation efficiency where possible and finally reducing applied water when they just don't have enough. Now, more than ever we need to know how to use available information and technology for optimal water use.

Process & Planning

Okay, so I need more than just a calendar to do the best job of irrigation. But what's this "*scientific*" thing? Does that mean I have to have a bunch of sensors, loggers and all that stuff? Not at all. In fact, the dictionary meaning of **science** is NOT 'using a bunch of gizmos/technology' but defined as: **"systematic knowledge of the physical or material world gained through observation and experimentation."** Wow, sounds pretty close to the definition of a good farmer! Being **scientific** simply means being consistent in how you record and analyze your observations so that you can develop a system for making the best decisions. This is where gizmos/technology are helpful, as they are tools to collect and analyze data/observations. Some of the most useful gizmos are strictly mechanical.

You can actually do scientific scheduling with no electronics at all; just your hands, a soil probe/auger, regular walks through the field, a notebook and a flometer or weir to record your actual applied water. This was all we

had 40 years ago. You don't even need a computer in the office! But most of us are farming too much acreage to know each field this intimately and we get tired of pounding/twisting soil probes and augers down to 5 feet. This is where electronic sensors, loggers and automated computer programs are helpful. These devices will automatically collect the data and can do the number crunching that saves you a lot of hand calculation. The only problem is that they're dumb. They don't think, they're usually stuck in one location without the ability to "look around" at the rest of the block. Thus, it's possible to do *"technified"* irrigation scheduling (this is the term they like in South America) with all this technology without it being truly *"scientific"*. In other words, you can collect a whole bunch of numbers but it's still up to the grower/manager to take those numbers and trends and turn it into systematic knowledge for truly optimal scheduling.

Figure 1 shows the multiple factors that need to be accounted for if you are going for top field performance. This looks complicated, but in reality most of these are fixed at the time you plant the orchard. Once you determine your soil water holding capacity and irrigation system design application rate, these will be fairly constant. Then the only in-season things that may vary and should be monitored are salinity in the rootzone and irrigation water (How good or bad is it?), soil/rootzone water content (How much is available, how fast are the plants using it?), irrigation frequency (How often?) and system uniformity (How even are my pressures, how often to flush hoses?) The salinity/quality factors are usually tested/treated once a year, unless you're injecting gypsum and/or acid. So once you've processed this data and planned the likely field logistics (i.e. vary irrigation hours to match daily/weekly need or vary onset of irrigation to match a set application say over 24 hours) it's just a matter of matching the volume water balance pieces together so you can …

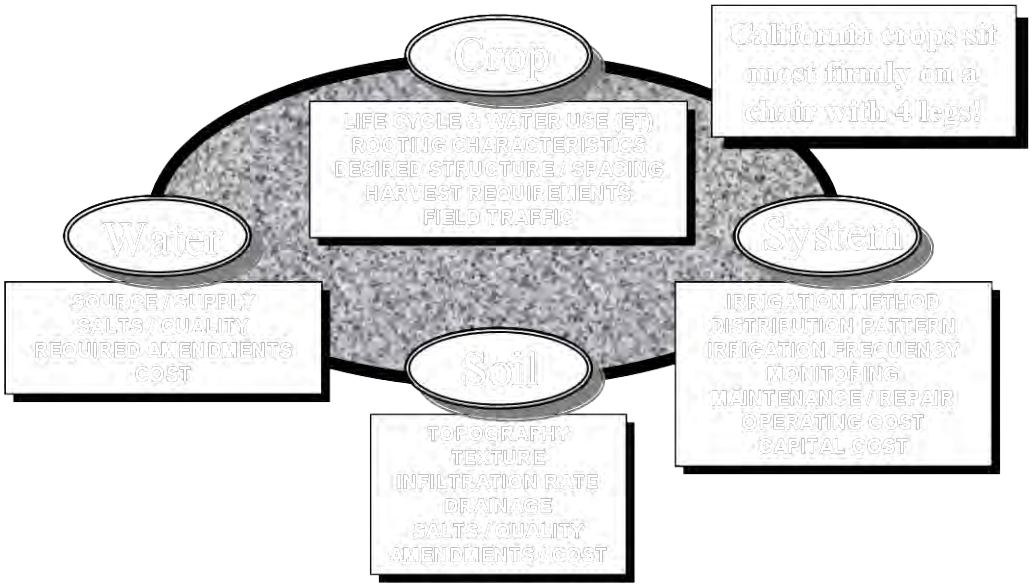


Fig. 1. Factors impacting crop production and irrigation scheduling / management.

Program

These data can be put into a table such as shown in **Table 1** or even one line of an Excel spreadsheet. You wouldn't think of buying a booster motor for your pump that didn't have the boiler plate specs on the casing. (Very similar to the 'boiler plate' of this Field 12-2.) But after 23 years of tromping the fields of Kern County I am still surprised by the number of growers and fields that don't have this simple yet critical information ready and easily accessible.

Table 1. Soil and irrigation system characteristics necessary for scheduling irrigations in mature almonds with 2, A-40 Fanjets per tree.

FIELD:	**12-2**		
SOIL TYPE:	Milham/Panoche sandy clay loam		
FIELD CAPACITY (in/ft):	2.4		
REFILL POINT (in/ft):	0.9	**Total Avail @ 100% (in):**	**9**
ROOTING DEPTH (ft):	6	**AREA/TREE (sq ft):**	504
ROW SPACING:	21' x 24'	**DESIGN FLOW (gph/tree):**	21.6
IRRIGATION SYSTEM:	2, 10.7 gph Fanjets		
NORMAL RUN TIME (hrs):	24	**WET AREA APPLIC (in):**	3.30
WETTED VOLUME (%):	50%	**NUMBER of SETS:**	3
		TOTAL AREA APPLIC (in):	1.65

Using this information along with expected "normal year" ET it's relatively straightforward to construct a simple water balance checkbook like the one below (which will be available at the workshop).

SOIL TYPE:	FIELD CAPACITY (in/ft):	REFILL POINT (in/ft):	ROOTING DEPTH (ft):	ROW SPACING:	IRRIG. SYSTEM:	NORMAL RUN TIME (hrs):	WETTED VOLUME (%):	Total Avail @ 100% (in):	AREA/ TREE (sq ft):	DESIGN FLOW (gph/tree):	WET AREA APPLIC (in):	NUMBER of SETS:	TOTAL AREA APPLIC (in):
Milham/ Panoche sandy clay loam	2.6	0.9	6	21' x 24'	2, 10.7 gph Fanjets	24	50%	10.2	504	21.4	3.27	3	1.63
Week Ending:	**6/15**	**6/22**	**6/29**	**7/6**	**7/13**	**7/20**	**7/27**	**8/3**	**8/10**	**8/17**	**8/24**	**8/31**	**9/7**
"Avg" Almond ET:	1.99	2.09	2.11	2.14	2.14	2.06	2.05	1.97	1.95	1.87	1.79	1.71	1.60
Run Time to Refill for Week (hrs):	29.2	30.6	31.0	31.4	31.4	30.2	30.1	28.9	28.6	27.5	26.3	25.1	23.5
Actual Run Time (hrs):	24	24	24	48	24	36	**Harvest**		48	48	**Harvest**	24	24
Cumulative Surplus or Deficit (hrs):	-5.2	-11.8	-18.8	-2.2	-9.5	-3.7	-33.8	-62.7	-43.3	-22.8	-49.1	-50.2	-49.7
Estimated Soil Moisture Depletion (inches):	0.71	1.61	2.56	0.30	1.30	0.51	4.60	8.55	5.90	3.11	6.69	6.84	6.77
Estimated Soil Moisture (% available):	**93%**	**84%**	**75%**	**97%**	**87%**	**95%**	**55%**	**16%**	**42%**	**70%**	**34%**	**33%**	**34%**

There are plenty of irrigation scheduling aids/programs on-line. A Google search of "free irrigation scheduling programs" returns more than 80,000 hits. The list will make your head hurt – even before you start to use them. Links to a few of these sites that I have looked at and can recommend as completely free and sponsored by worthy organizations are below:

http://www.cimis.water.ca.gov/cimis/infoIrrSoftware.jsp - Concise list of free and pay-for scheduling software. Some tutorials on basic scheduling. State of CA, Sacramento.

http://www.waterright.org/ - Checkbook type schedule, all on-line, mostly crop water demand based on CIMIS weather and standard crop coefficients. Cal State Fresno, CATI.

http://biomet.ucdavis.edu/irrigation_scheduling/bis/BIS.htm - Multi-worksheet Excel file, completely downloadable, soil moisture estimation but no feedback adjustment. Most comprehensive list of crop coefficients. Calculator for estimating daily crop coefficients. Rick Snyder, UC Davis.

http://cesanjoaquin.ucdavis.edu/files/14724.xls - Simple one-page worksheet checkbook for winegrape irrigation scheduling.

http://oiso.bioe.orst.edu/RealtimeIrrigationSchedule/index.aspx - Most complex of the extension type web-based scheduling programs. Has the capacity to create integrated whole ranch schedules. Difficult to use, but with some of the best "feedback" calculations.

Farmers Should Make a Skin Check a Priority

American Academy of Dermatology

Farming has plenty of challenges. One of the hazards that farmers worry about the least are the dangers from working in the sun year-round. Harvest time can provide a reminder for farmers to pay attention to the condition of their skin.

"More than 11,000 Americans die each year from skin cancer," says Dr. David M. Pariser, a dermatologist and president of the American Academy of Dermatology. "But when detected early, skin cancer has a cure rate of 99 percent. Since research shows farmers are among the least likely workers to receive a skin examination by a physician, it's important that farmers perform regular skin self-examinations, which could mean the difference between life and death."
It's as easy as "ABC" to remember how you can identify a mole or lesion that needs the attention of a dermatologist:

Asymmetry (one half is unlike the other)
Border (irregular, scalloped or poorly defined)
Color (varies from one area to another)
Diameter (the size of a pencil eraser or larger)
Evolving (changing in size, shape or color)

To help farmers minimize their risk of skin cancer, the American Academy of Dermatology recommends that everyone Be Sun Smart:

* Use water-resistant sunscreen with a sun protection factor (SPF) of at least 30 on all exposed skin, before heading out to the field or pasture. Re-apply approximately every two hours, even on cloudy days.
* Wear long-sleeved shirts, pants, a wide-brimmed hat and sunglasses.
* Stay in the shade when possible, and make sure your tractor has a sun umbrella. The sun's rays are strongest between 10 a.m. and 4 p.m.
* If working near water, snow or sand, seek extra shade because these surfaces reflect the sun's rays and increase your chance of sunburn.
* Look at your skin after each harvest. Ask a partner to help. If you notice any moles or spots changing, growing or bleeding, make an appointment to see a dermatologist.

The Academy offers a downloadable Body Mole Map with information on how to perform a skin exam and images of the ABCDEs of melanoma. The mole map is available at www.aad.org/checkspot. The site also has information on how to find a free cancer screening from a dermatologist in your area.

Performing a skin self-exam requires regularly looking over the entire body, including the back, scalp, soles of the feet and between the toes, and on the palms. It is important to use both a full-length mirror and a hand-held mirror to see the scalp, back and buttocks.

For more information about skin cancer, visit the SkinCancerNet section of www.SkinCarePhysicians.com .

Feeding Habits of California Ground Squirrels and Their Role in Management

Terry Salmon
Wildlife Specialist

Squirrels eat a variety of fresh greens as well as seeds and dried nuts. In spring, ground squirrels prefer greens over seeds and nuts. Once the natural grasses begin to dry and wither, squirrels will actively forage for seeds.

As foragers, squirrels are well-adapted to find sparsely dispersed food, one seed at a time. Once squirrels have had their fill, they will collect food in their cheek pouches and take it back to the nest to form a cache for later use. Squirrels tend to forage close to their burrow, although they will travel for desirable foods.

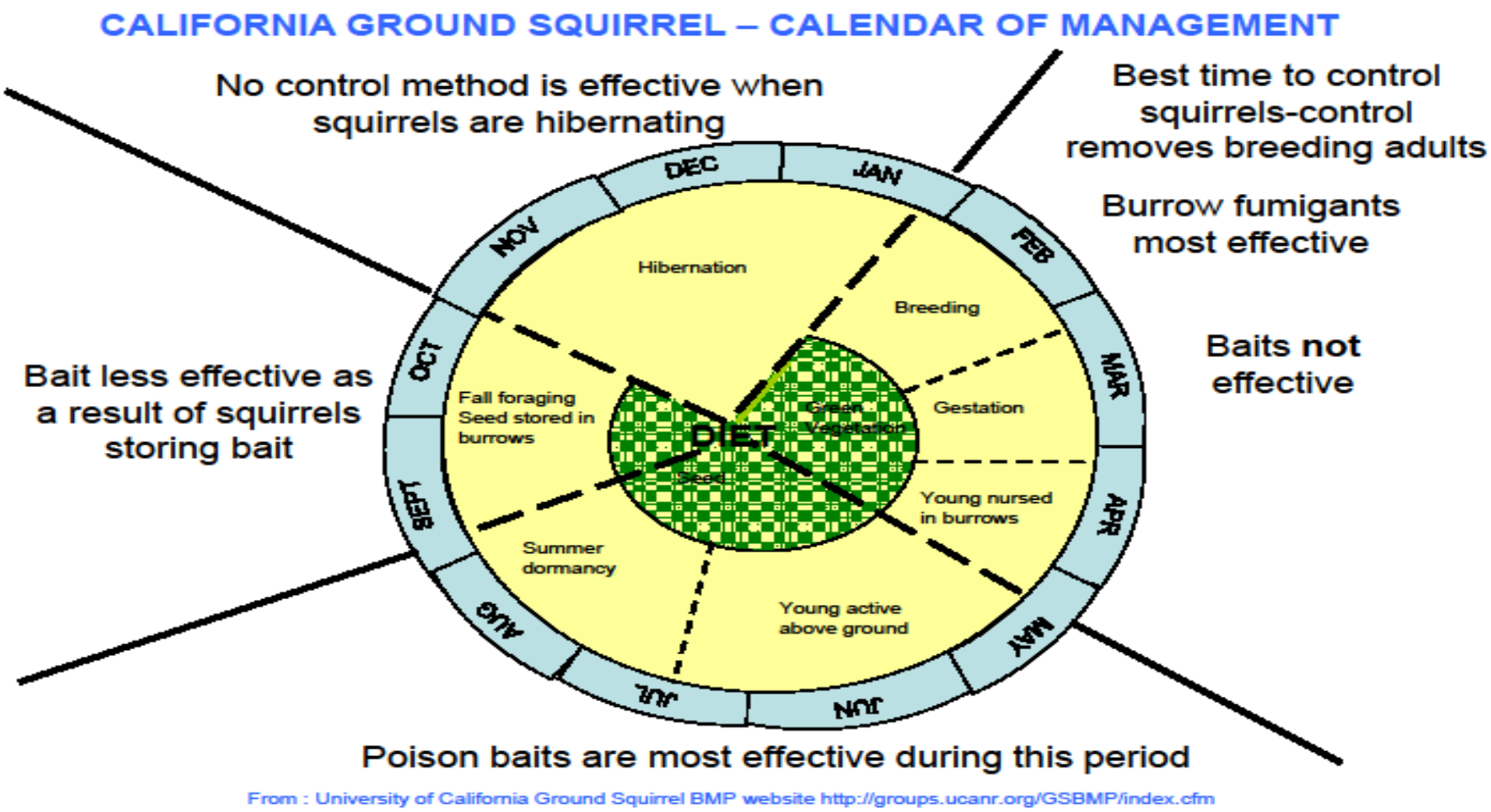
How Biology relates to control:

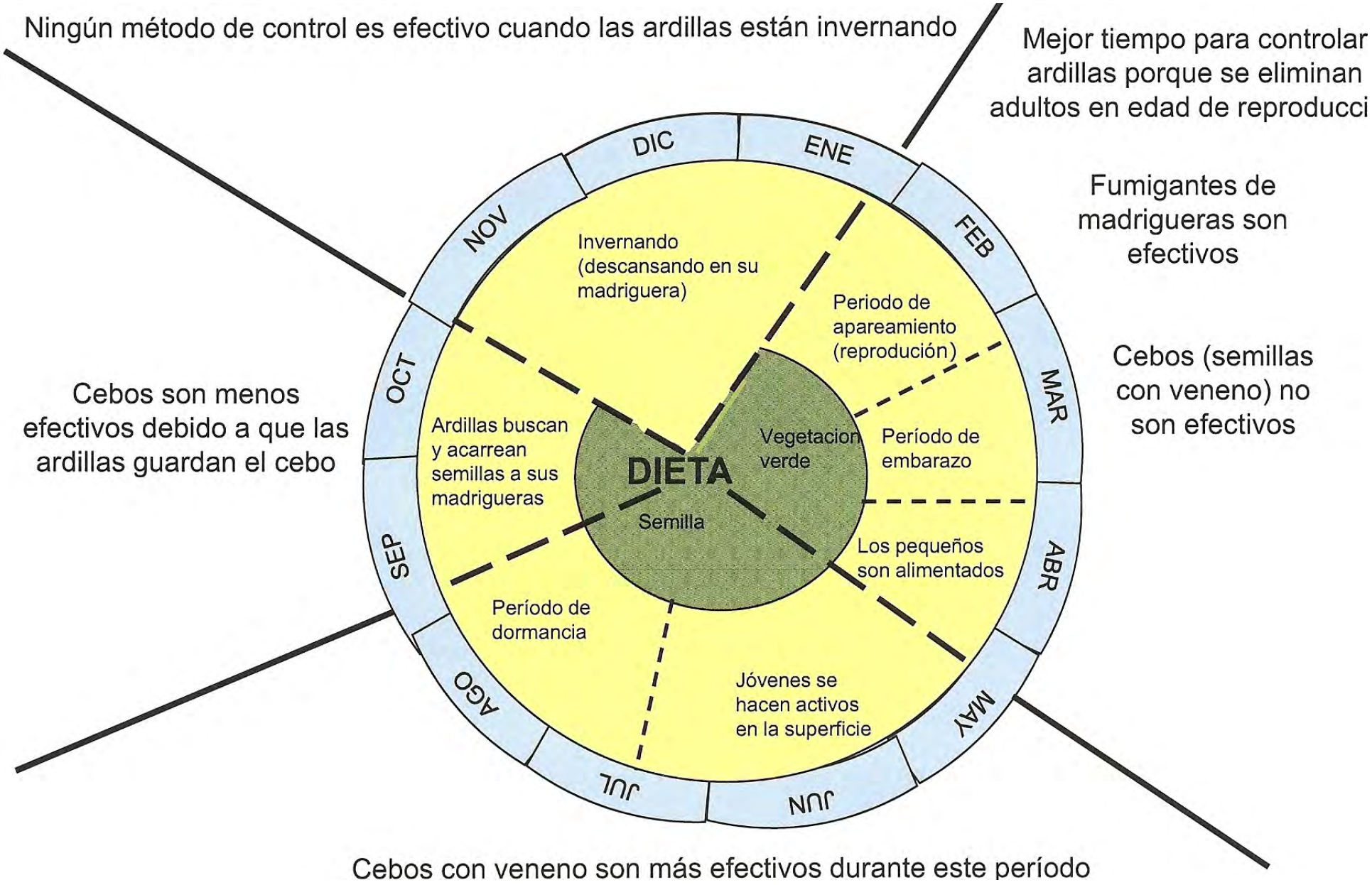
The California ground squirrel prefers to forage for food in the early morning or late afternoon/early evening to avoid the day's heat. In some crop situations, especially nut crops,

squirrels may prefer the crop to the point where they will not eat any bait. If the squirrel won't eat the bait, the poison bait method will not work. In this case, an alternative control approach may be necessary (trapping or fumigation).

Understanding these feeding preferences is extremely important when using baits since they are seed based. Also, in irrigated crops or landscape areas, squirrel feeding preferences are influenced by what food is available. For example, the natural vegetation may be dry in early summer and squirrels are actively foraging for seed. If newly sprouted crops are available however, the squirrels may take them with great delight.

The calendar of ground squirrel diet, activity and control measures is adapted from the Best Management Practices for California Ground Squirrel Control website at http://groups.ucanr.org/GSBMP/. Calendar dates are merely an estimation of time; actual time frames may vary according to the weather. The calendar may be laminated for use in planning and training for your operation.


CALIFORNIA GROUND SQUIRREL – CALENDAR OF MANAGEMENT
No control method is effective when squirrels are hibernating
Best time to control squirrels-control removes breeding adults
Burrow fumigants most effective
Baits not effective
Bait less effective as a result of squirrels storing bait
DEC
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEPT
OCT
NOV
Hibernation
Breeding
Gestation
Young nursed in burrows
Young active above ground
Summer dormancy
Fall foraging Seed stored in burrows
DIET
Green Vegetation
Seed
Poison baits are most effective during this period
From : University of California Ground Squirrel BMP website http://groups.ucanr.org/GSBMP/index.cfm


Ningún método de control es efectivo cuando las ardillas están invernando
Mejor tiempo para controlar ardillas porque se eliminan adultos en edad de reproducci
Fumigantes de madrigueras son efectivos
Cebos (semillas con veneno) no son efectivos
Cebos son menos efectivos debido a que las ardillas guardan el cebo
Cebos con veneno son más efectivos durante este período
DIC
ENE
FEB
MAR
ABR
MAY
JUN
JUL
AGO
SEP
OCT
NOV
Invernando (descansando en su madriguera)
Periodo de apareamiento (reprodución)
Período de embarazo
Los pequeños son alimentados
Jóvenes se hacen activos en la superficie
Período de dormancia
Ardillas buscan y acarrean semillas a sus madrigueras
DIETA
Vegetacion verde
Semilla